
ORGANIZED BY

HYPOGEA RESEARCH AND VALORIZATION ARTIFICIAL CAVITIES

# CONGRESS SCHEDULE

**From March, 11 (Wednesday) to March, 13 (Friday)**
INTERNATIONAL CONGRESS SESSIONS
CNR- Consiglio Nazionale delle Ricerche - Sala Marconi
Piazzale Aldo Moro, 7 - Rome (Italy)

**March, 14 (Saturday)**
DISCUSSION MEETING *(Italian language)*
COMUNE DI ROMA - Musei Capitolini -
Sala Pietro da Cortona
Piazza del Campidoglio, 1 - Rome (Italy)

March, 15 (Sunday): GUIDED TOUR "HYPOGEA OF THE ALBAN HILLS"

March, 16 (Monday): GUIDED TOUR "GALLICANO AND TIVOLI ROMAN BRIDGES"

March, 17 (Tuesday): GUIDED TOUR "UNDERGROUND NARNI"

## ORGANIZED WITH

INTERNATIONAL UNION OF SPELEOLOGY

SOCIETÀ SPELEOLOGICA ITALIANA

PARCO REGIONALE DEI CASTELLI ROMANI

SOCIETÀ ITALIANA DI GEOLOGIA AMBIENTALE

CNR - DIPARTIMENTO SCIENZE DEL SISTEMA TERRA E TECNOLOGIE PER L'AMBIENTE

CNR - ISTITUTO RICERCA E PROTEZIONE IDROGEOLOGICA

CNCA - COMMISSIONE NAZIONALE CAVITÀ ARTIFICIALI

## MEDIA PARTNERS

JOURNAL OF SPELEOLOGY IN ARTIFICIAL CAVITIES

ARCHEO

ARCHEOLOGIA VIVA

ASSOCIAZIONE SCINTILENA - SPELEOLOGICAL NEWS

BLOG ROME INSIDER

## TECHNICAL PARTNERS

TELECOM ITALIA DIGITAL SOLUTION

ASSOCIAZIONE CULTURALE SUBTERRANEA

GRUPPO SPELEO ARCHEOLOGICO VESPERTILIO

GRUPPO STORICO ROMANO

## CONTACTS

**Web site:** hypogea2015.hypogea.it
**Mail:** hypogea2015@gmail.com
**Facebook:** hypogeaweb
**Twitter:** hypogea2015

The main objective of the congress is to exchange the experience acquired, both at international and national level, in the field of speleological and speleo-underwater research of artificial hypogea (man-made underground structures of archaeological-historical interest), and to promote the preservation of subterranean historical and cultural heritage.

The congress will focus on international thematic sessions dealing with the speleological research undertaken during shared archaeological field missions; international standards in place including the adoption of cartographic symbols and a dictionary; the newly established Web site (UIS) linking to the Registry of Artificial Cavities and the comparison between different typologies of artificial hypogea, which have been extensively studied. Other thematic sessions include an overview of the legislation in different countries, potential scaling up of internationally important Italian projects on hypogea, such as the Map of Ancient Aqueducts and the magazine *Opera Ipogea - Journal of Speleology in Artificial Cavities*.

## SCIENTIFIC COMMITTEE

- **Mario PARISE** - Italy (CNR-IRPI, Bari; President of Artificial Cavities Commission UIS)
- **Kyung Sik WOO** - The Republic of Korea (President UIS; Department of Geology, College of Natural Sciences, Kangwon National University)
- **George VENI** - USA (Vice President UIS; NCKRI Executive Director National Cave and Karst Research Institute, Carlsbad, New Mexico)
- **Fadi NADER** - Lebanon/France (General Secretary UIS; Geologist; IFP Energie nouvelles, Geosciences Division, Geology)
- **Mladen GARAŠIČ** - Croatia (University of Zagreb, Faculty of Civil Engineering; Society for research, surveying and filming on Karst Phenomena /DISKF/, Zagreb; Croatian Speleological Federation)
- **Philipp HÄUSELMANN** - Switzerland (Swiss Institute for Speleology and Karst studies, UIS working group survey and mapping)
- **Boaz ZISSU** - Israel (Bar-Ilan University, Martin (Szusz) Department of Land of Israel Studies and Archaeology; Artificial Cavities Commission UIS)
- **Michele BETTI** - Italy (President of Commissione Nazionale Cavità Artificiali of Società Speleologica Italiana; PhD to the Università degli Studi di Urbino 'Carlo Bo')
- **Roberto BIXIO** - Italy (Hon. Inspector for Artificial Cavities - MiBACT; Artificial Cavities Commission UIS; President of Centro Studi Sotterranei, Genoa)
- **Vittoria CALOI** - Italy (CNR, Grottaferrata; Egeria Centro Ricerche Sotterranee, Rome; Commissione Nazionale Cavità Artificiali SSI)
- **Sossio DEL PRETE** - Italy (Geologist; Editor-in-chief of Opera Ipogea – Journal of Speleology in Artificial Cavities, Caserta; Commissione Nazionale Cavità Artificiali SSI)
- **Andrea DE PASCALE** - Italy (Archaeologist; Curator of Museo Archeologico del Finale IISL, Finale Ligure; Commissione Nazionale Cavità Artificiali SSI; Centro Studi Sotterranei, Genoa)
- **Carla GALEAZZI** - Italy (Secretary of Artificial Cavities Commission UIS; Commissione Nazionale Cavità Artificiali SSI; President of Hypogea; Egeria Centro Ricerche Sotterranee, Rome)
- **Mario MAZZOLI** - Italy (General Manager A.S.S.O., Rome)
- **Adriano MORABITO** - Italy (President of Roma Sotterranea, Rome)
- **Roberto NINI** - Italy (Archaeologist; Utec/Subterranea, Narni)
- **Cristiano RANIERI** - Italy (Archaeologist; Gruppo Speleo Archeologico Vespertilio, Salisano)
- **Stefano SAJ** - Italy (Architect; Centro Studi Sotterranei, Genoa; Director of Opera Ipogea - Journal of Speleology in Artificial Cavities; Commissione Nazionale Cavità Artificiali SSI)
- **Simone SANTUCCI** - Italy (Roma Sotterranea, Rome)

# GENERAL PROGRAM

WEDNESDAY, MARCH 11, 2015
Rome (Italy) CONSIGLIO NAZIONALE DELLE RICERCHE - Sala Marconi
Piazzale Aldo Moro, 7

9.00-10.00 Arrival and registration of participants
10.00 Opening Ceremony
*Welcome coffee*

All Sessions are held in English (max 12 min. + 3 min. discussion)

**11.00-12.15 SESSION HYDRAULIC WORKS I**

- ✓ Issues concernig ancient roman aqueducts. *Lombardi Leonardo, Santucci Elettra*
- ✓ The map of the ancient underground aqueducts in Italy. *Parise Mario, Galeazzi Carla, Germani Carlo, Bixio Roberto, Del Prete Sossio, Sammarco Mariangela*
- ✓ Trajan Aqueduct: the Santa Fiora branch. *Germani Carlo, Colombo Vittorio*
- ✓ The Campanian Aqueduct stairway rediscovered. *Ferrari Graziano, Lamagna Raffaella*
- ✓ A new stretch of the *Turris Libisonis* aqueduct in Punta di lu Cappotto (Porto Torres, Sassari, Sardinia): preliminary considerations and recent acknowledgements. *Dore Pier Paolo, Piras Giuseppe*

**12.15 - 13.00 SESSION NEW TECHNOLOGIES FOR ARTIFICIAL CAVITIES**

- ✓ Exploration and documentation of underwater artificial structures. *Mazzoli Mario*
- ✓ Potential and limitations of new technologies for the survey of morphology and colour of rupestrian habitat. *Carpiceci Marco, Inglese Carlo, Colonnese Fabio*
- ✓ Laser scanner survey and tru view applications of the "Grotta della Lucerna" (Ravenna, Italy), a Roman mine for *Lapis Specularis*. *Santagata Tommaso, Lugli Stefano, Camorani Marco Ennio, Ercolani Massimo*

*Lunch*

**15.00-16.15 SESSION HYDRAULIC WORKS II**

- ✓ Lost Costantinople: subterranean water structures - application of speleology techniques in the archaeological research. *Aygün Çiğdem Özkan, Eğilmez Ali Hakan*
- ✓ Urban hydrographic network of Genoa's historic centre: the underground course of the Fossatello stream. *Bixio Roberto, Saj Stefano, Traverso Mauro*
- ✓ Water supply tunnels of Istanbul Küçükçekmece lake basin (Bathonea). *Kuruçayırlı Emre, Eğilmez Ali Hakan, Küçükali Gülşen, Albukrek Metin, Uzel Elif Aytekin, Aydıngün Şengül G.*
- ✓ Water tunnels of Güvercinlik Valley (Cappadocia, Turkey). *Gilli Eric, Yamaç Ali*

**16.15-17.00 SESSION MISCELLANEOUS (GEOLOGY)**

- ✓ Palaeoclimate and palaeoenvironmental reconstructions from speleothems in artificial caves (Lazio, Italy). *Tuccimei Paola, Soligo Michele*
- ✓ Subaqueous anti-stalactites: a new type of speleothem from the old aqueduct of Sassari (Sardinia, Italy). *Sanna Laura, Forti Paolo*

## THURSDAY, MARCH 12, 2015
Rome (Italy) CONSIGLIO NAZIONALE DELLE RICERCHE - Sala Marconi
Piazzale Aldo Moro, 7

All Sessions are held in English (max 12 min. + 3 min. discussion)

**9.30-11.00 SESSION MINING WORKS**

- ✓ An ancient highway to the tufa quarries. New considerations on a forgotten monument North of Rome. *Schatzmann Andreas*
- ✓ Perticara mine (Emilia-Romagna, Italy): first re-exploration, documentation and problems. *Belvederi Giovanni, Garberi Maria Luisa*
- ✓ An underground historical quarry in the Hanbury Botanical gardens of Ventimiglia (Italy). *Faccini Francesco, Corvi Marco, Perasso Luigi, Raso Emanuele, Mariotti Mauro G.*
- ✓ The Cozzo Disi mine (Casteltermini, Sicily, Italy) a multi-disciplinary approach to record, study, preserve and develop the mining heritage in Sicily. *Badino Giovanni, Chiappino Claudia, D'Aquila Antonio, Fiorenza Fiorenzo, Spitaleri Giuseppe, Vattano Marco*
- ✓ Formignano mine: a study for the research project of Emilia-Romagna Regional Speleological Federation "Eastern Romagna Gypsum and Sulphur". *Ponti Elisa*
- ✓ Ancient underground channels near Orvieto. *Bellocchi Edoardo, Morucci Marco*

*Coffee break*

**11.30-12.00 SESSION SYMBOLS, TYPOLOGIES AND CADASTRE OF ARTIFICIAL CAVITIES**

- ✓ Underground structures from Istanbul Çatalca/Maltepe. *Aydıngün Şengül G., Eğilmez Ali Hakan, Aydıngün Haldun, Gürbüz İlker,Gürbüz Gülhun, Albukrek Metin, Küçükali Gülşen, Kuruçayırlı Emre, Erdem Bülent*
- ✓ Artificial caves of Divnogorye (Russia). *Gunko Alexey, Kondratyeva Sofya*
- ✓ First remarks on some very interesting artificial cavities in Croatia. *Garasic Mladen, Garasic Davor*
- ✓ The UIS symbol set for cave maps and its possible extension for artificial cavities. *Häuselmann Philipp*

*Lunch*

**13:30- 17:00 GUIDED TOURS**

GUIDED TOURS to hypogea and archaeological sites of special interest in Rome (Trastevere area). The program is being updated according to access permits.

- **MITREO DEL CIRCO MASSIMO** (Velabro): Just a stone's throw away from the world famous "Mouth of Truth ("Bocca della verità"), in the undergrounds of an old building, one of the few - and one of the best preserved! -temples of Mithra still visible in town. Built in the 3rd century A.D. inside a pre-existing structure related to the adjoining Circus Maximus, it consists of five rooms and contains an amazing marble bass-relief with Mithra killing the bull.

- INSULAE DI SAN PAOLO ALLA REGOLA Inside a residential building in Trastevere, we will have the opportunity of going eight meters underground, travelling back in time through four different levels. You will see a very complex stratification of buildings from different periods. Some of the rooms belonged to a big warehouse built by Emperor Domitian (Horrea Vespasiani) to stock food to be distributed freely to the citizens of Rome. On a higher level, windows and a courtyard belong to an *insula* (building) that hosted poor people. The clay pipes and decorations evoke the presence of an ancient laundry (*fullonica*).

- **SOTTERRANEI DI S. CRISOGONO** Entering the S. Crisogono church along the busy Viale Trastevere and opening a tiny door in the sacristy, we will have to descend a winding staircase in order to reach the archaeological remains six meters below. Here the structures have been modified and reused for centuries. This is one of the first places where the early Christians gathered, reusing for their rituals the spaces of two or three houses, dating back to the 2nd and 3rd century A.D.

## FRIDAY, MARCH 13, 2015
Rome (Italy) CONSIGLIO NAZIONALE DELLE RICERCHE - Sala Marconi
Piazzale Aldo Moro, 7

**9:00 THE HISTORICAL ROMAN GROUP GREETINGS**

All Sessions are held in English (max 12 min. + 3 min. discussion)

**9.15-10.15 SESSION MISCELLANEOUS**

- ✓ Proposal International Congress Hypogea2017. *Gilli Eric, Yamac Ali.*
- ✓ The galleries of Palmanova (Friuli-Venezia Giulia, NE Italy). *Feresin Fabio, Diqual Augusto, Giacomin Antonio*
- ✓ Underground visions (movie). *D'Alessandro Massimo*
- ✓ Lapis Specularis (movie). *Demaria Danilo FSRER*

*Coffee break*

**10.30-13.00 POSTER SESSION**
Poster presentations and open discussion (3 min. discussion each)

HYDRAULIC WORKS

- Ancient and medieval underground hydro-technical structures of Armenia. *Davtyan Smbat R.*
- The old aqueducts of the Valley of Logulentu (Sassari, Sardinia). *Dore Pier Paolo, Dallocchio Eleonora*
- The Albano outlet (Castel Gandolfo, Rome, Latium): the Project Albanus and new acquisitions. *Galeazzi Carla, Germani Carlo, Casciotti Luigi*
- Survey, analysis and relevant interpretation of further interventions in the underground site of *Claudium* (Rome). *Gradozzi Marco*
- Infiltration galleries, ancient constructions and geology integrated in the landscape of Nemi Maar (Alban Hills, Central Italy). *Loret Emanuele, Medici Franco, Medici Giacomo, Testana Carlo*
- The Aqueduct Paul: new archaeological discoveries. *Ranieri Cristiano, Felluca Elena*

HYPOGEAN CIVILIAN DWELLINGS

- Cave settlements in Southern Apulia. Rupestrian evidence in the Valleys of Otranto. *Calò Stefano*
- Underground anthropogenic landscape in the Armenian Highland: from the Late Stone Age to the Middle Ages. *Shahinyan Samvel, Davtyan Smbat, Pogrosyan Gacik*
- Dovecotes and cave dwellings of Gesi - Kayseri (Turkey). *Tok Ezgi, Yamaç Ali*
- Cave dwellings of Halfeti - Urfa (Southeastern Turkey). *Yamaç Ali*
- Underground cities of Kayseri (Turkey). *Yamaç Ali, Tok Ezgi, Filikci Betul*

RELIGIOUS AND CULT STRUCTURES

- Artificial Christian religious cave "Skanovo" in the Penza Region, Russia. *Agapov Ilya, Leontev Mihael*
- Religious buildings in Ortahisar (Turkey). The survey of the complex of Sakli and Ali Torun Kilise. *Crescenzi Carmela, Giustiniani Claudio, Ricchera Giacomo*
- Man made cavities on the South-East side of the Albano lake, within the Albano Volcanic Area (SE of Rome, Italy). *Felici Alberta, Cappa Giulio, Cappa Emanuele*
- Caves in Divnogorye and Belogorye: monastic and folk tradition in the river Don caves construction. *Stepkin Vitaliy Viktorovich*
- The artificial cavities of Bulgaria. *Zhalov Aleksey*

ARCHAEOLOGICAL STUDIES

- Archaeological study of Kvemo Kartli region rock-cut monuments in Georgia. *Bakhtadze Nodar*
- The underground cemetery of San Senatore. *Libera Roberto*
- Artificial cavities within the hill of Prima Porta (Rome, Italy). *Pellandra Davide Ivan*

MINING WORKS

- Sarmanovsky copper mine. *Gunko Alexey*
- Abandoned and deactivated mines in the Eastern Italian Alps (Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia). *Laureti Lamberto*
- Underground history of Domodedovo District. *Yanovskaya Ekaterina, Garshin Dmitry*

NEW TECHNOLOGIES FOR ARTIFICIAL CAVITIES

- Rock hewn architecture survey: the problem of construction of the geometrical model. *Carpiceci Marco, Cresciani Giovanna, Angelini Andrea*
- Recent developments of 3D scanning in real time. *Catoni Gabriele*

SYMBOLS, TYPOLOGIES AND CADASTRE OF ARTIFICIAL CAVITIES

- Contribution to the definition of cartographic symbols for artificial cavities. *Bixio Roberto, Saj Stefano, De Pascale Andrea*
- The underground cavities in the of territory of Rome: typologies, distribution and sinkhole susceptibility. *Ferri Gianluca, Succhiarelli Claudio*
- Classification of artificial underground structures. *Dolotov Yuri*
- Terms about artificial cavities in UIS caver's multi-lingual dictionary. *Garasic Mladen*
- The Cadastre of artificial cavities of Rome and Lazio. *Germani Carlo, Galeazzi Carla, Galeazzi Sandro*

MISCELLANEOUS

- The (underground) architecture as subtractive act. *Di Donato Stefania*
- Speleology in artificial cavities and archaeoastronomy: the cave of Casnea in Briaglia (Cuneo, Italy). *Milla Fabrizio*

*Lunch*

**15.00-16.45 SESSION HYPOGEAN CIVILIAN DWELLINGS**

- ✓ A huge cultural and historical heritage at risk: the underground settlements of Southern Italy. *Parise Mario*
- ✓ Surveying some of the touristic underground cities of Cappadocia (Turkey). *Yamaç Ali, Tok Ezgi*
- ✓ The rupestrian heritage of Djabal Nafūsa: a study on settlements and architectural forms. *Polimeni Beniamino*
- ✓ The San Pellegrino rock-hewn complex at Matera: a magnificent example of the rupestrian culture in Southern Italy. *Lionetti G., Borneo V., Santarcangelo S., Pelosi M., Parise M.*
- ✓ New surveys on underground structures in Cappadocia: a dialogue between art historians, conservators, archaeologists and speleologists. *Andaloro Maria, Benucci Michele, Bixio Roberto, De Pascale Andrea, Romagnoli Giuseppe*
- ✓ The necropolis of Hellenistic Maresha Judean Foothills, Israel. *Zissu Boaz, Kloner Amos*
- ✓ Artificial caves cut into cliff tops in the Galilee and their historical significance. *Shivtiel Yinon*

**16.45-17.00 SESSION MISCELLANEOUS (ARCHITECTURE)**

- ✓ Urban undergrounds: the worldwide perspective. *Varriale Roberta*

**17.00 Closing of the international conference sessions**

**20.30 SOCIAL DINNER**
Roman cooking in old and modern times: dinner in a typical Roman "Tavern" located in the Jewish Quarter of Rome.

## PROCEEDINGS

THE PROCEEDINGS WILL BE AVAILABLE AS SUPPLEMENT TO THE MAGAZINE OPERA IPOGEA – JOURNAL OF SPELEOLOGY IN ARTIFICIAL CAVITIES N. 1/2015 (ITALIAN SPELEOLOGICAL SOCIETY, ISSN 1970-9692, HTTP://WWW.OPERAIPOGEA.IT).

## SATURDAY, MARCH 14, 2015
Rome (Italy) COMUNE DI ROMA - Musei Capitolini - Sala Pietro da Cortona
Piazza del Campidoglio, 1

**10:00 - 13:00 *Mundus Subterraneus***
Discussion-meeting (in Italian language) between Speleologists, experts and organisations responsible for the environment, history and cultural heritage in Italy to discuss the standards, valorisation and risks of artificial cavities. In conclusione del Congresso Internazionale gli speleologi incontrano geologi, archeologi, architetti, amministratori e divulgatori. Opinioni e progetti a confronto sul potenziale scientifico e di sviluppo socio economico delle cavità artificiali. Conoscenza, documentazione, valorizzazione e costante sfida tra modernizzazione e tutela.

**Modera:**
**Stefano Saj,** *Direttore Opera Ipogea - Journal of Speleology in Artificial Cavities*

**Intervengono:**
**Fabrizio Ardito,** *Giornalista e scrittore*
**Cinzia Barbante,** *Vice Comandante Vigilanza Parco Regionale Castelli Romani*
**Michele Betti,** *Presidente Commissione Nazionale Cavità Artificiali Società Speleologica Italiana*
**Sandro Caracci,** *Commissario Straordinario Parco Regionale Castelli Romani*
**Andrea De Pascale,** *Curatore Museo Archeologico del Finale - Istituto Internazionale di Studi Liguri*
**Giorgio De Rita,** *Segretario e Direttore Generale CENSIS*
**Carla Galeazzi,** *Presidente Hypogea Ricerca e Valorizzazione Cavità Artificiali, International Union of Speleology*
**Giuseppe Gisotti,** *Presidente S.I.G.E.A.- Società Italiana di Geologia Ambientale*
**Fausto Guzzetti,** *Direttore Istituto di Ricerca per la Protezione Idrogeologica - Consiglio Nazionale delle Ricerche*
**Mario Mazzoli,** *Direttore Generale A.S.S.O. - Archeologia, Subacquea, Speleologia e Organizzazione*
**Adriano Morabito,** *Presidente Roma Sotterranea*
**Roberto Nini,** *Presidente Italia Sotterranea*
**Mario Parise,** *Geologo Istituto di Ricerca per la Protezione Idrogeologica - Consiglio Nazionale delle Ricerche* **Riccardo Pozzo,** *Direttore Scienze Umane e Sociali, Patrimonio Culturale - Consiglio Nazionale delle Ricerche*
**Maurizio Todini,** *Umbria Sotterranea*
**Carlo Zelinotti,** *Vigili del Fuoco Roma*

SONO STATI INOLTRE RIVOLTI INVITI AD ALTE PERSONALITÀ DEL SETTORE ARCHEOLOGICO E TURISTICO, PROTEZIONE DELL'AMBIENTE E REALIZZAZIONI MUSEALI. IN ATTESA DI CONFERMA PARTECIPAZIONE.
PARTICIPATION OF EMINENT EXPERTS FROM THE DOMAINS OF ARCHAEOLOGY, TOURISM, ENVIRONMENTAL PROTECTION AND MUSEUMS IS PENDING CONFIRMATION.

**14:45 - 17:00 GUIDED TOURS**

GUIDED TOURS to hypogea and archaeological sites of special interest in Rome. The program is being updated according to the access permits.

- **SOTTERRANEI DI S. SABINA** (Aventino): The magnificent Church of St. Sabina lies on top of the Aventine hill, overlooking the Tiber river and the Tiberine Island. The underground hosts the remains of rich aristocratic houses and temples, as well as one of the first places where the early Christians gathered together in the house of a roman matron: Sabina. We will also be able to see a portion of the ancient republican city walls.

- **CAVE DEL CLAUDIUM** (Celio): A real medieval tuff quarry in the heart of Rome, a few meters from the Colosseum. Crossing the gate and proceeding inside a monastery closed to the public, we will have the chance to admire the massive structures of the Temple of Claudium. Passing under the temple arches and descending a metal staircase, we will enter another dimension, with water dripping from the vaults and galleries dug in the heart of the Caelian hill. The little crystal-clear ponds are the final bonus to this visit. N.B. For this visit, torch and caving helmet are required.

FOLLOWING THE CONGRESS, EXCURSIONS WILL TAKE PLACE

## PROGRAM OF THE GUIDED TOUR "HYPOGEA OF THE ALBAN HILLS"
## MARCH 15, 2015

**Duration**: from 8.00 to 20.00
**Difficulty**: as specified for each hypogeum
**Participation fee** for registered attendees: included in the Congress registration fee
**Participation fee** for not-registered attendees: € 40,00
**The fee includes**: transfer by coach and daily insurance
**The fee does not include**: meals

### THE ALBAN HILLS (COLLI ALBANI)

Not far from the sea but above the marshy areas in the Pontine plane, the Alban Hills have harboured human settlements since time immemorial. Here are to be found agricultural and pastoral villages, imperial villas, convents, castles and towns whose inhabitants have deeply shaped the enviroment. From prehistory to the present, they have canalized the springs, terraced the steepest slopes and controlled the lakes level.
This natural and cultural heritage, consisting of works largely still in use, allows to study the territory with a depth and a latitude not possible in other regions of Italy. Not surprisingly, the speleological investigations of underground structures of anthropical origin carried out by the Center for Underground Research Egeria have produced a large amount of documents, aiming at protecting the works that the ingenuity of our ancestors has left us.
The Alban Hills, located a few km south-east of Rome, have been the center of the "*Latium vetus*", inhabited by Latin populations and by the ancestors of the Romans. Thanks to the mild climate, and from the II century b.c.E. until past century, the Roman aristocrats have chosen these hills as the favourite site where to spend their leisure time, the latin "*otium*" (leisure). For this reason villas, baths and gardens have been built; all these structures needed water supply, in turn requiring complex systems of collection and transportation, mainly underground, a fact that has helped to preserve a large part of them until today.

In 312 b.c.E. the Appian way was built, reinforcing the close relations among Rome and the Alban Hills, especially with the areas of the lakes Nemi and Albano, a connection still strong nowadays.
Pompey, Cicero, Tiberius, Domitian and Antoninus Pius had their villas not far away, so that the Alban area became the seat of a refined culture, inclining towards the Greek world and differing from the official Roman culture. We know of the existence of at least 50 among villas and other structures, of which only a few have been studied in detail.
After the fall of the Western Roman empire (476 c.E.), the area became depopulated and the only sign of some continuity in housing is given by the burials of the V-VI century at the Orti of S.Nicolas. The invasions that took place one after the other gave origin also on the Alban Hills to the process known as "incastellamento": the inhabitants looked for shelter in fortifications on high grounds. Various noble families built here their strongholds, around which over the centuries developed the villages known at present as "Roman Castles".
There is no other reliable information on this area until the XII cen., when a few small monastic communities near lake Nemi are mentioned in some papal Bulls. In the following centuries the Nemi area, and in general the Alban Hills, follow the fate of the papal State and become the theater of the fights among the Pope and the noble Roman families. At the same time, the Hills harboured the rich country dwellings of the papal nobility, all equipped with parks and fountains. In the XIX cen. the Nemi area still preserves its charm and it is often the destination of tourists and travelers, among which Byron, so to become one of the important destinations of the Grand Tour. As well known, this was the tour of Europe that the offspring of rich North-European families used to do when reaching majority.
In between the 19$^{th}$ and the 20$^{th}$ centuries the Nemi crater, still all wooded, gave the initial inspiration to J.G.Frazer (1854-1941) for his most famous work " The Golden Bough", a fundamental, even if discussed, text in the studies of archaic religions.
The Second world war has not too severely touched the area, anyway causing deaths, destruction and the disastrous burning of the two ships attributed to Caligula, which had been taken out of the lake since only a few years, and were exhibited in the Museum of the Nemi ships. Today asphalt and cement are spreading in the surroundings of Rome and have reached the Alban Hills. Only the establishment of the regional Park of the Roman Castles has enabled to stem the definitive destruction of the sceneries dear to Ovid and Byron.

## PROGRAM

### THE ALBANO DRAIN OUTLETS

The drains were built to control the level of the lakes Albano and Nemi, which have no natural outlet. Beside this control measure, the works undertaken resulted in a formation of a large water reservoir, which could be used for irrigation or as a source of hydropower to operate the mills and factories. This was a great accomplishment at the time considering the technical and planning challenges encountered including the limited means available.

### THE ALBANO DRAIN (CASTEL GANDOLFO)

***Difficulty**: None, sportswear advisable*

The Albano drain outlet is the most famous among the various ones found in the Alban Hills, and it is also the only one of which something is known through historic sources. According to Livy, it dates back to the beginning of the 4th century B.C., and the Oracle of Delphi, which declared that the city of Veii would not be conquered (by the Romans) unless the Lake Albano was prevented from overflowing its banks. Also Dionysius of Alicarnassus (I,66) mentions Livy's text, but at the same time suggests that the drain may be older. The study by Piranesi, full of technical details and beautiful engravings, greatly contributed to its fame. The tunnel is 1,450 m long. At present the Albano drain is the object of a three-year program of speleological studies, carried out by Hypogea in cooperation with the Superintendence for the Archeological Heritage of Lazio and the Castelli Romani Park.
The aim of the visit to the *incile* (inlet) is to share with the participants the first results of the research undertaken, in view of future technical and scientific studies, and of the establishment of a scientific committee.

### THE NEMI DRAIN (NEMI)

***Difficulty**: the crossing of the drain does not require special speleological techniques; equipment: helmet with LED light and boots.*

The construction of the drain dates back to still unknown times; it is generally placed between the end of the sixth century and the beginning of the fifth century B.C.. Contrary to the Albano drain, the system Nemi-Ariccia is not mentioned in ancient historical sources. Starting in the 1990ies, intensive speleological investigations were carried out (Castellani, Caloi, Dragoni); the campaign was completed in the years 2002-2003 by the Center for Underground Research Egeria. The tunnel of 1,653 m in length was made accessible with the technique of *blind excavation*, starting from two opposite points of the mountain. The starting points were fixed with the method of the *coltellatio* (chopping) and the meeting point was found out by *hearing contact*. As mentioned previously, on Lake Nemi, emperor Caligula (12-41 C.E.) built leisure gallies for his court; their replicas can be seen at the Museum of the Roman Galleys, together with the remains of the temple of Diana *Nemorensis*.

*Albano and Nemi drains (Photo Carlo Germani, CRSE Archive)*

THE NIMPHAEUM BERGANTINO OR OF DIANA (CASTEL GANDOLFO)

***Difficulty**: none, sportswear advisable*

The Nimphaeum is located in a natural cave, which may be dated to Domitian time (end of the first century), and therefore related to the imposing ensemble of Domitian's Alban villa. In 1841 unauthorized excavations, later under the control of the Camerlingo, unearthed many statues and mosaics, some of which are now at the pontifical villas in Castel Gandolfo. The Nimphaeum Bergantino is named after an old owner, according to Lugli; or else, the name derives from the corruption of the word "brigantino", a type of sailing ship. In fact, the nimphaem cave could have been used as a shed for boats. Recently, the Castelli Romani Regional Park has started the restoration of the Nimphaeum.

THE CATACOMB OF SAN SENATORE (ALBANO)

***Difficulty**: none, sportswear advisable*

The catacomb is located at the XV mile of the Appian Way, under the convent of Saint Mary of the Star, and is one of the most important catacombs in southern Lazio. The Catacomb of San Senatore, beside being dedicated to the cult of the local martyrs and as a burial place, it was also an important cult center for the religious life of residents and pilgrims. From the 4th and 5th centuries, the burial area, was the main graveyard of the Christian community in Albano, and, according to some scholars, also of Ariccia. Initially used as a *pozzolana* quarry, the site was then turned into a burial ground, and was used from the third century to the twelfth century. Its lengthy lifespan is probably due to the use of one of the underground rooms as an ecclesia. That is, a place of worship, first for early Christians worshipping the local martyrs and then for a nearby monastic community. The earliest written records regarding the catacombs of San Senatore in Albano come from the early fourth century: the *Depositio Martyrum* mentions August 8$^{th}$ as the anniversary of the passion of the martyrs Secondo, Carpoforo, Vittorino and Severiano, all of whom are buried in Albano. The seventh century De Locis describes this place as the burial site of Senatore and Perpetua's bodies. The ancient galleries lead straight onto the Appian way, and, despite the radical changes later applied to the facade of the cave overlooking the *Regina Viarum*, it is possible to reconstruct the presence of at least five different entrances. There are, in two areas of the Christian Hypogeum, a series of well-preserved frescoes. One of these frescoes, the oldest, is the Christ standing between St. Peter, St. Lawrence, St. Paul and another unknown figure. The historic crypt, believed to be the catacomb area in which the martyrs' relics were kept, contains a series of paintings ranging from the 5th century to the high Middle Ages. When visiting the front of the apse, on the wall to the left, there appears a painting portraying a young Christ seated between six other figures over a sky-blue background, with only Peter and Paul being identifiable. The apse of the historic crypt contains a fresco depicting Christ between the busts of the Virgin and St. Smaragdo. Next to the apse, there is also the image of a young saint, whose portrait is possibly attributed to St. Senatore.

*The Catacomb of San Senatore (photo courtesy R. Libera)*

## PROGRAM OF THE GUIDED TOUR "GALLICANO AND TIVOLI"
## ROMAN ACQUEDUCTS AND BRIDGES ITINERARY
## MARCH 16, 2015

**Duration**: from 8.00 to 16.00
**Difficulty**: *speleological techniques not required; equipment: helmet with LED light and boots.*
**Individual participation fee**: euro 40; reservation at registration is required
**The participation fee includes**: transfer by coach and daily insurance
**The fee does not include**: meals

Every Italian remembers the story of the gooses of the Campidoglio. However, even Gallicano nel Lazio has a similar story to tell: a cockcrow woke up the citizens who were sleeping during a night siege, betrayed the invaders and saved the town from the conquest. As a sign of gratitude, the name of the town resembles and rember the one of the cockerel (in Italian "gallo"). According to the other version, less picturesque but probably more reliable, Gallicano was named after a nobleman who lived in one of the numerous patrician villas built after the Roman conquest in 417 b.C., in the area where the town rises up nowadays. The territory of Gallicano is crossed by the remains of as many as four ancient Roman acqueducts which descend from the upper Aniene valley:

ANIO VETUS (272-270 A.C.)
AQUA MARCIA (144-140 A.C.)
AQUA CLAUDIA (38-52 D.C.)
ANIO NOVUS (38-52 D.C.)

The Anio Vetus and Novus drew their waters directly from the river while the Aqua Marcia and Claudia were filled with the purest of spring waters, which flowed down these ancient artificial channels for dozens of miles, all the way to Rome. A large portion of their route was underground, but they also crossed the distinctive narrow valleys and deep ravines found in the area supported by the arches of mighty bridges, many of which are still standing. Five of these bridges are easily reached along a charming walking itinerary which also runs past other local archaeological sites, all couched in a truly remarkable natural landscape.
The itinerary comprises the natural 'cut' in the tufa bed called the Tagliata di S. Maria di Cavamonte and the renowned **Amato bridge** that spans it, built between the 2nd and 1st century BCE and recently restored. A bit further ahead are the ruins of some of the most important Roman aqueducts. Despite the fact that the aqueducts ran underground for the majority of their lengths, there are still traces of the many bridges built to carry the channels over deeply-eroded gorges in the tufa substrate. The finest example of all is **Ponte Lupo**, with a 115 meter span rising to 30 metres height.
A visit to the remains of the Anio Vetus, Aqua Marcia, Anio Novus and Aqua Claudia aqueducts in the Prenestine area is a fascinating itinerary.
These aqueducts provided almost 70% of the city's water supply and got their water from the upper Anien valley. Having run parallel for a long stretch of the valley as far as the Tiburtine plain, they were then divided by the hills of the Prenestine countryside to reflank again past the Alban Hills and follow the Via Appia and the Via Tuscolana to Rome. Their route which was a long one given the need to maintain a constant incline to allow the water to flow naturally, was for the most part underground, but crossing the valley the aqueducts emerged from underground to become some striking artificial bridges.

At the 30th kilometre of the road to Poli, we come across an old semidestroyed mill, following the traces of an ancient Roman flag-stoned road we come to the bridge of the Mill on the Mola gully. This was part of the Anio Vetus, was built between 272 and 269 B.C. by the censors Manius Curius Dentatus and Fulvius Flaccus and consisted of a dual order of 22 arches some 156 metres long and 24.5 metres high. The bridge, in opus mixtum, had a four-meter incline as can be seen from the last three arches.
Continuing along the path we come across the Aqua Marcia which is hidden in thick vegetation. This was used to cross the Mola gully across the St. Peter bridge. It was 90 metres long and 19 high and was built by the praetor Quintus Marcius Rex in 144 B.C. with square travertine blocks. The bridge, which has a central arch flanked by other small arches, was later faces with opus mixtum during the reign of Titus and still later strengthened with buttresses under the Severe emperors and Diocletian.

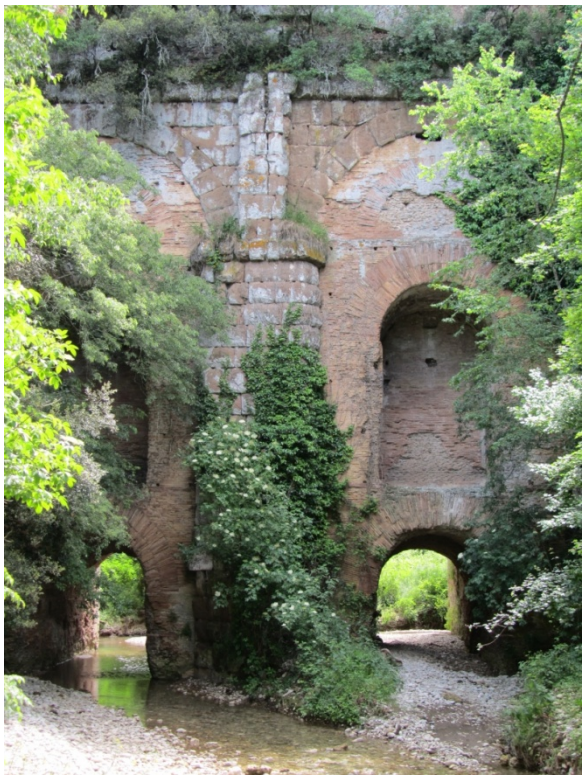
*From Web*

On the road from S. Vittorino to Gericomio a small path lead to the St. Anthony bridge, which belonged to the Anio Novus and spans the Acqua Raminga gully. This grandiose bridge was 125 metres long and 33 high and was built by Claudius in 52 A.D. with square tufa and calcareous ashlar blocks and has one wider arch flanked by six other arches on the northern side and two smaller arches on the southern side. There are traces of brickwork used to reinforce the bridge in the 4th and the 5th centuries A.D. when some even smaller arches were added.

One of the most important, and impressive, remaining bridges in the area of Rome is the Ponte Lupo, just south of the road to Poli. It is a massive and confused mass of original stone and concrete repair, 115 metres long and 30 metres tall. The evidence show that this bridge carried the Aqua Marcia. This colossal structure, was originally built in 144 BC out of cut-stone quarried from the tufa slopes on the valley's left bank near the bridge. The only remains of the structure are the two tall arches that are clearly visible at the stream. A century later the bridge had deteriorated badly enough to necessitate almost complete replacement. Agrippa, rather than shoring up the original structure, replaced all but the two central stone archways. Agrippa's engineers were the first in Rome to use concrete in the construction of aqueduct arches and they built a bridge that was too airy for this material. Nero's engineers were to repeat the mistake in the next century. Within a few decades Agrippa's work was again shored up by adding encasing walls. Titus found it necessary to repeat this in 79 AD. Hadrian found it necessary to add a few encasing walls and buttresses, but nothing as dramatic as the former repairs. Caracalla's repairs of 212 AD were more substantial, and the bridge required only minor repairs less than a century later. The resulting work is a conglomeration of construction techniques and materials that, while not following Vitruvius' admonition that structures should be beautiful, was certainly
strong and useful.

Technical note
There was a limit to the height to which the Romans built the arches over which aqueducts were carried. It is possible for a tall pillar to fold sideways in the middle during a high wind or if subsidence had taken place a the base. If one pillar gave way, it could cause a progressive collapse of the whole series of arches.
The Roman solution was to limit the height of the arches to about 21 metres. When they worked near this limit they made the pillars very massive, and the arches between them narrow. If a greater elevation was required, the Romans built the arches in two tiers, the pillars of the upper resting directly on those of the lower. The arches of the lower tier could me made simple and not very heavy, their sole purpose being to brace the pillars from each side. They consisted of the solid wedge-shaped stones which

formed the arches themselves and shaped stone forming a level top course above the arch. The structure above the upper tier was exactly like that on a single-tier aqueduct.
When the aqueduct had to cross a deep valley, for some reason the engineers had decided not to use a siphon, and than the same principle (multi tiers) might been used. This technique does not appear to have been used near Rome, probably because it was not necessary to do so.



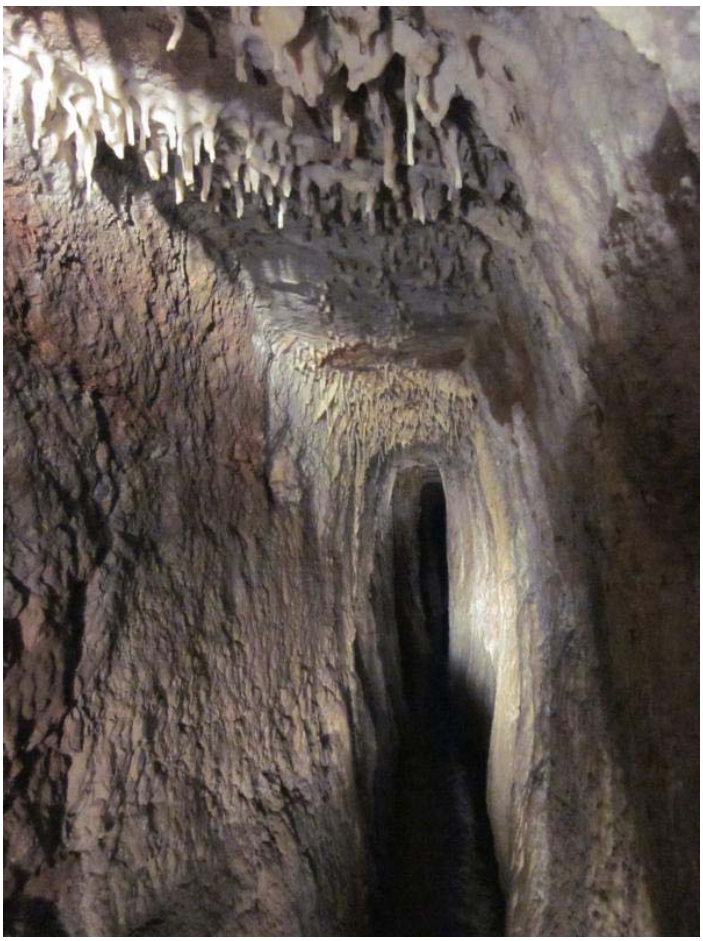

*From Web*

*We thanks for allowing the visit:* Mario Galli, Marina Pennini, Principe Urbano Barberini, Comune di Gallicano nel Lazio, Azienda Agricola di Passerano, Università Agraria di Passerano

## PROGRAM OF THE GUIDED TOUR "UNDERGROUND NARNI"
## MARCH 17, 2015

**Duration**: from 8.00 to 20.00
**Difficulty:** as specified for each hypogeum
**Individual participation fee:** Euro 40.00
**The participation fee includes:** bus transfer and daily insurance. The guided tour is provided by the Cult. Ass. "Subterranea"
**The fee does not include:** meals

**Program**
The Umbrian town *Nequinum* was conquered in the 3rd century B.C. by the Romans, who founded the Latin settlement Narnia (a name used in the past century by C.S. Lewis for his famous Chronicles). The town is crossed by the Flaminia way and significant monuments of the Roman period have been preserved here, such as an imposing bridge built by the Emperor Augustus and the long aqueduct named Formina. Destroyed during barbarian invasions, the town reached its maximum splendor in the Middle Ages, as shown by the urban characteristics and by the several historical buildings, including the fortress and many churches, such as the Cathedral, S. Francesco, S. Maria Impensole and S. Maria Maggiore (now S. Domenico).



*The Formina aqueduct. Photo courtesy of Serena Novelli*

THE FORMINA AQUEDUCT
EXCURSION WITH A LIMITED NUMBER OF PARTICIPANTS: MAXIMUM 35
**Difficulty:** No special speleological techniques are required, but please make sure to bring a safety helmet with head lamp, boots and change of clothes. The water is at knee height.

The Roman aqueduct "Formina" was probably built by the "*curator aquarum*" Marcus Cocceius Nerva in 27 C.E. during the reign of Tiberius. The aqueduct is about 13 km long and maintains a constant slope. It winds along the hillsides, crosses three mountains with many tunnels and traverses across bridges over a few streams in *opus quadratum*. The Subterranea offers the opportunity of discovering a fascinating underground route inside the only Roman aqueduct open to the public in Italy. It is possible to walk for 700 m, long enough to realize the difficulties overcome by the workers during the digging, and to admire the wonderful concretions. The exit is through a steep spiral staircase dug into the rock from an 18-meter deep well. A change of clothes and shoes is necessary. The visit is not recommended for those who suffer from claustrophobia and for people weighing more than 100 kg.

THE UNDERGROUND OF THE CHURCH OF S. DOMENICO: THE INQUISITION CELLS
**Difficulty:** none

The visit begins under the convent of S. Domenico by entering a twelfth-century church, discovered as late as 1979 by the speleologists of UTEC. The church contains some of the oldest frescoes in town. Through a passage in the wall, one enters a room with a Roman cistern, likely the remnant of a *domus*; further on, through a long tunnel, one reaches a large room where the interrogations by the Inquisition took place. Various documents found in the Vatican Archives and in the Trinity College in Dublin attest to the existence of inquisition cells. A small cell, unique in its kind in Italy, documents the sufferings of the prisoners, one of whom had left an intriguing message with esoteric and masonic symbols, not yet completely deciphered.

*The Inquisition cells in S. Domenico convent. Photo courtesy of Marco Santarelli*

THE ROMAN AND MEDIEVAL CISTERNS
**Difficulty:** none

The underground visit of S.Maria Impensole takes you to two Roman cisterns with an eight century church built on top, which was later converted into a Romanic church. The tour of "Underground Narni" ends inside the Lacus, the large Early Medieval cistern, located under the fountain at the Garibaldi square, formerly known as the square of the *Lacus*.

| PARTICIPANTS | COUNTRY |
|---|---|
| Agapov Ilya | RUSSIA |
| Albov Dmitry | RUSSIA |
| Albukrek Metin | TURKEY |
| Badino Giovanni | ITALY |
| Bakhtadze Nodar | GEORGIA |
| Bellocchi Edoardo | ITALY |
| Belvederi Giovanni | ITALY |
| Bersani Pio | ITALY |
| Betti Michele | ITALY |
| Bixio Roberto | ITALY |
| Bottiglia Ruggero | ITALY |
| Calò Stefano | ITALY |
| Caloi Vittoria | ITALY |
| Cappa Giulio | ITALY |
| Caracciolo Bruno | ITALY |
| Carpiceci Marco | ITALY |
| Casciotti Luigi | ITALY |
| Catoni Gabriele | ITALY |
| Chiappino Claudia | ITALY |
| Colombo Vittorio | ITALY |
| Crescenzi Carmela | ITALY |
| D'Alessandro Massimo | ITALY |
| Dallocchio Eleonora | ITALY |
| Delicato Adele | ITALY |
| De Luca Andrea | GERMANY |
| De Paolis Antonio | ITALY |
| De Pascale Andrea | ITALY |
| Di Donato Stefania | ITALY |
| Diqual Augusto | ITALY |
| Dixon Linda | ENGLAND |
| Dixon Martin | ENGLAND |
| Dobosz Tullio | ITALY |
| Dolotov Yuri | RUSSIA |
| Dore Pier Paolo | ITALIA |
| Egilmez Ali Hakan | TURKEY |
| Elena Rognoni | ITALY |
| Enrico Brugnoli | ITALY |
| Fabrizio Ardito | ITALY |
| Faccini Francesco | ITALY |
| Felluca Elena | ITALY |
| Feresin Fabio | ITALY |

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|---|---|
| Ferrari Graziano | ITALY |
| Ferri Gianluca | ITALY |
| Ferris David | ENGLAND |
| Forti Paolo | ITALY |
| Galeazzi Carla | ITALY |
| Galeazzi Sandro | ITALY |
| Garasic Mladen | CROATIA |
| Garberi Maria Luisa | ITALY |
| Garshin Dmitry | RUSSIA |
| Germani Carlo | ITALY |
| Gilli Eric | FRANCE |
| Giuseppe Gisotti | SIGEA |
| Giustiniani Claudio | ITALY |
| Gospodinovic Tomislav | CROATIA |
| Gradozzi Marco | ITALY |
| Gunko Alexsey | RUSSIA |
| Häuselmann Philipp | SWITZERLAND |
| Hellmayr Leoni | GERMANY |
| Ingmar Arnold | GERMANY |
| Kloner Amos | ISRAEL |
| Kloner Hannah | ISRAEL |
| Kondrateva Sofya | RUSSIA |
| Kripina Ivan | CROATIA |
| Laureti Lamberto | ITALY |
| Leontyev Mikhail | RUSSIA |
| Libera Roberto | ITALY |
| Lombardi Leonardo | ITALY |
| Manna Luigi | ITALY |
| Markov Andrei | RUSSIA |
| Mazzoli Mario | ITALY |
| Medici Franco | ITALY |
| Milla Fabrizio 33 | ITALY |
| Mojo Andreana | ITALY |
| Morabito Adriano | ITALY |
| Motycka Zdenek | CZECH REPUBLIC |
| Nekrassova Iana | ITALY |
| Nini Roberto | ITALY |
| Ozkan Aygun Cigdem | TURKEY |
| Paone Rosario | ITALY |
| Parise Mario | ITALY |
| Pellandra Davide Ivan | ITALY |
| Piga Luigi | ITALY |

| | |
|---|---|
| Pilloni Maria Teresa | ITALY |
| Piras Giuseppe | ITALY |
| Pizzorusso Ann | U.S.A. |
| Polimeni Beniamino | TURKEY |
| Ponti Elisa | ITALY |
| Potzsch Helmut | GERMANY |
| Potzsch Michèle Carmen | GERMANY |
| Qeraxhiu Lydra | ITALY |
| Ranieri Cristiano | ITALY |
| Re Rossella | ITALY |
| Riccardo Pozzo | ITALY |
| Saj Stefano | ITALY |
| Sammarco Mariangela | ITALY |
| Sanna Laura | ITALY |
| Sanna Luana | ITALY |
| Santagata Tommaso | ITALY |
| Santarcangelo Samantha | ITALY |
| Santucci Elettra | ITALY |
| Santucci Simone | ITALY |
| Sarnataro Geppina | ITALY |
| Scatolini Andrea | ITALY |
| Schatzmann Andreas | ITALY |
| Scherrer Rene | SWITZERLAND |
| Schultz Hans Michael | GERMANY |
| Shivtiel Yinon | ISRAEL |
| Siccardi Marisa | ITALY |
| Stepkin Vitalii Viktorovich | RUSSIA |
| Succhiarelli Claudio | ITALY |
| Todini Maurizio | ITALY |
| Tok Egzi | TURKEY |
| Trinchero Maria | ITALY |
| Tuccimei Paola | ITALY |
| Varriale Roberta | ITALY |
| Vitelli Marco | ITALY |
| Volpini Elena Alma | ITALY |
| West Richard | ENGLAND |
| Yamac Ali | TURKEY |
| Yanovskaya Ekatherina | RUSSIA |
| Zhalov Alexey | BULGARIA |
| Zissu Boaz | ISRAEL |

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